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THE EXTENSION ANIMAL HUSBANDMAN

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Special Articles in this Issue: Page

Marsh Farm Colt Feeding Demonstration, by L. P. McCann 2

Market Lamb Shows as an Extension Project,
by H. A. Lindgren 13

Also:

Work Stock Parasite Control 5

Miscellaneous News Items 6

Some Federal Research Results 7

You Have to Like Your Job 14

1935 State Report Briefs 15

Southern Animal Husbandry Conferences 16

Nonrail Receipts of Livestock, 1935 17

Special Notice 17

Extension Methods in Illinois 18

South Dakota 4-H Lamb Clubs 22

Recent Publications 23

MARSH FARM COLT FEEDING DEMONSTRATION

By L. P. McCann, Extension Animal Husbandman,
Ohio State University

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An average sale price of $229.64 per head on 21 two-year-old draft colts was the closing chapter of a feeding demonstration conducted in northwestern Ohio in 1934-1935. Early in 1934 through the local county agent, Vic R. Phares, arrangements were made with W. G. Weigle, manager of the Marsh Farm, who had this bunch of weanling colts, for the feeding demonstration. These colts had been bought from farmers in Van Wert and adjoining counties of Ohio. They had been purchased at ages varying from 6 to 10 months during the fall and winter of 1933-1934. It was the intention of Mr. Weigle to carry these colts along, growing them out for sale at some future time.

Some explanation may be in order at this point in regard to the farm on which these colts were owned. The Marsh Farm was established some years ago through a trust fund which provided for an orphanage and the farm in connection with it. On approaching Van Wert from the east on U.S. Route 30 one finds the Marsh Foundation Orphanage located at the edge of the city. It consists of a fine group of modern brick cottages. The above highway divides the farm although the bulk of the 1,400 acres is located to the north of the Orphanage.

The idea of conducting a feeding demonstration with this group of colts for a period of one year was suggested to Mr. Weigle and after some thought he agreed to the proposition. In the beginning it was the intention to divide the colts into at least two groups so that different rations might be tried out with each group of colts. However, owing to the layout of the farm and the location of the buildings in which the colts would have to be housed, it was impossible to arrange for a satisfactory division of the colts in such a way that results could be accurately checked. It was, therefore, decided to carry the colts as one group. In the early spring of 1934 when plans were first put in motion for starting the demonstration there were 18 colts on hand but additional farmers wanting to dispose of colts offered them to Mr. Weigle at such prices that he could not well afford to turn them down. Consequently, when the demonstration actually was started there were 22 head in the group and they consisted of 10 mares and 12 geldings.

The sale price mentioned at the beginning of this discussion might lead readers to believe that the colts had been an outstanding lot of individuals at the start but this was not the case. Some of the colts were exceptionally good individuals but on the other hand many of them would have been classed as decidedly ordinary and a few looked extremely common at the time they were first weighed up for the start of the demonstration.

On June 19, 1934, the colts were started on the demonstration and their average weight was 984.1 pounds. One year later on June 18, 1935, their average weight was 1,408.6 pounds. This gave them an average gain per head of 424.5 pounds during the period when they were growing from yearlings to two-year-olds. The greatest gain made by any individual colt during this time was 560 pounds and the least gain was 180 pounds. During the first summer the colts were carried on bluegrass pasture. Toward the end of that summer this had to be supplemented with other types of pasture that were available on the farm, consisting principally of wheat and oats stubble. Grain was fed throughout this period consisting of 2.8 pounds shelled corn and 1.4 pounds of oats per head per day. When the pasture season ended in the fall the grain mixture was increased to:

Shelled corn	3.7 lbs.
Oats	1.9 "
*Protein mixture	0.4 "
Alfalfa hay	11.5 "
Corn stover	1/2 bundle

During the first year distemper affected a number of the colts on two occasions. In late August and early September the outbreak was most severe and during the four weeks' weighing period ended September 11, the 22 head of colts lost an average of 29.6 pounds per head. During the month of March following, they again lost an average of 15 pounds per head from the effects of the second outbreak. Had it not been for these two setbacks the gain for the entire first year might have been considerably larger than the figure quoted. In May 1935 the colts again were placed on bluegrass pasture. When this became short in the late summer, Sudan grass pasture, which had been seeded especially to take care of such an emergency was used to supplement the permanent pasture. Also, throughout the 1935 summer season the following ration was fed on pasture:

**Corn & oats mixture	6.4 lbs.
*Protein mixture	0.65 "
Alfalfa hay	9.0 "

*Linseed meal, soybean oil meal and tankage, equal parts.
**Corn 3 parts, oats 1 1/4 parts.

In addition to the trouble with distemper many other difficulties were encountered that affected the progress of these colts in the early part of the demonstration. For instance, after they had been turned into a woods pasture it was discovered that part of this land had been used for a trash dumping ground a number of years before. On hot days while they were milling around under the shade of trees several of the colts picked up nails in their feet. Until the source of these nails was discovered in the woodlot several of the colts suffered severely and their gains were materially affected because of resulting lameness. The summer of 1934 proved very dry and the carrying capacity of the pasture was materially cut down. Green fields on the other side of the fence were too attractive for the colts to resist and there were occasional fence jumping injuries which caused set-backs to some of the colts. One such injury resulted in an abscessed elbow which had to be lanced twice, a large amount of pus being drained from the opening on each occasion. Another of the colts was given an anti-toxin injection to forestall lockjaw after it had been badly snagged on a fore foot. When the distemper outbreak was at its height several of the colts had to have their throat glands lanced. Although these resulting losses in weight were high on some of the individuals they all recovered eventually. Because of some of these injuries and the bad cases of distemper, a few of the colts had to be isolated for brief periods but their feed records were included with the totals in making summaries.

Originally it was not intended to use a protein supplement in the ration but this plan was changed as a result of the attacks of distemper which left the colts in a rather weakened and run-down condition. While gains were fairly satisfactory most of the time the colts did not pick up in flesh during the first 12 months sufficiently to make them attractive in appearance. Because of this the protein supplement was continued through the summer feeding period. When they were taken off pasture in November 1935, they were changed from shelled corn to corn-and-cob meal and their ration from then until the time they were sold on December 11 was as follows:

Corn-and-cob meal	4.7 lbs.
*Oats, molasses, tankage mixture	3.3 "
Alfalfa hay	15.0 "

Throughout the latter part of the demonstration colt No. 21 failed to do well and his condition became rather serious. A veterinarian who regularly looked after the health of the colts was not

*Oats 20 parts, commercial molasses feed 10 parts, tankage 2 parts.

able to diagnose the trouble but continued treating this colt throughout the last six months of the demonstration. When the colts were removed from pasture it was very evident that this colt which was a sorrel gelding, was not responding to treatment and for this reason it was decided to dispose of him to a reduction plant and charge his feed bill and original cost to the other remaining 21.

On December 11 the 21 head were sold at auction and brought the average price referred to in the opening paragraph. Their average weight on December 3, which was the final weight period in the feeding demonstration, was 1,663.8 pounds. There were 10 mares and 11 geldings in the group and the mares outsold the geldings by an average of $88.50 per head. The average price which the mares brought was $276 per head compared with $187.50 for the geldings. The top price of $335 was paid for a black Percheron mare eligible to registration. She was by far the heaviest animal in the group and had finished the demonstration weighing 1,920 pounds. The lightest weight colt in the group was a sorrel gelding which finished with a weight of 1,260 pounds and he brought the lowest price in the auction, selling for $130. All the colts were grades except the black mare already referred to. Two other mares sold above the $300 mark, a black-gray bringing $320 and a sorrel going at $315.

The total average gain per head on the 21 colts sold was 667.6 pounds during the entire time of the feeding demonstration, which was 533 days. This gave them an average daily gain of 1.25 pounds per head. Charging the feed bill of the one colt that was lost against the remaining 21 gave an average feed cost per head of $73.89 for the entire period. Feeds were not charged at the same price throughout the demonstration for the simple reason that prices varied greatly during that time and the demonstration was carried on with the idea of keeping it as nearly as possible on the basis of average farm conditions. At no time was this work considered as being conducted as strictly experimental but rather as a demonstration.

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WORK STOCK PARASITE CONTROL

County agricultural agents have cooperated with veterinarians in 35 counties in the treatment of work stock for internal parasites, particularly bots. Eighteen thousand animals were treated in 1935 under this program. The plan calls for the assembling by farmers of their animals at designated points on dates announced by the county agent. The county agent uses the local press together with letters to call educational meetings at which the work is explained. The veterinarians administer the vermifuge and examine the animals for corrective dental defects and other needed treatments. The plan has been successful and farmers have had such work done at reasonable prices.

--From Mississippi Annual Report, 1935.

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MISCELLANEOUS NEWS ITEMS

The Tennessee Jack and Jennet Breeders' Association was organized at Columbia, Tenn., on January 28, 1936, with the following officers: E. E. Burnell, president, Rt. 5, Nashville, Tenn.; L. R. Neel, secretary-treasurer, Columbia, Tenn. The purpose of the organization is to foster the jack-stock industry of the State in every legitimate manner. More than 50 charter members were enrolled at the meeting.

"The Quality Lamb Producer" is the name of a new weekly mimeographed publication issued by the Animal Husbandry Extension Service of Iowa State College in the interest of its quality-lamb-production project. The publication is intended to provide timely information to progressive lamb producers of the State.

The second fat stock show and sale was held at Jacksonville, Fla., on March 10-11, 1936. Six hundred and thirty-eight head of cattle from 18 counties of the State, as compared with 148 head in 1934, were shown. Eighteen head of 4-H club calves were included. Nine 4-H judging teams participated as compared with 5 last year. In addition to the judging, market grade demonstrations of live cattle and of beef were conducted as well as a beef-cutting demonstration. The event was sponsored by the Florida Extension Service under the direction of W. J. Sheely, extension animal husbandman.

The Alabama Extension Service announces a ton-litter show to be held at the Union Stock Yards, Montgomery, Ala., September 10, 1936. All cooperators in the ton-litter project of the State are eligible to compete.

The outstanding producer in the Hoosier Ton Litter Club for 1935 was John F. Allan of Sullivan County, Ind., who produced 8 litters of pigs that averaged 1,972 pounds per litter at 180 days of age. The average weight per pig was 239 pounds.

The Animal Husbandry Extension Service of Iowa State College has just issued a long-time program for the livestock production project of that State, which contains 18 pages and sets forth the major factors expected to influence the program together with objectives, organization, methods, etc.

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SOME FEDERAL RESEARCH RESULTS

(In response to several requests for information regarding results of animal husbandry investigations conducted by the U.S.D.A. the following excerpts have been made from the 1935 annual report of the Chief of the Bureau of Animal Industry to the Secretary. It should be understood that much of the information is of progress-report character from projects still under way. --C. D. Lowe)

Genetics

Two inbred strains were maintained in Chester White swine. Brother-sister matings in the most advanced strain have now reached the seventh generation. During the last three farrowing seasons litter size averaged 9 pigs in the third generation, 8.8 in the fifth, 5 in the sixth, and 6.25 in the seventh, 8.8 in the outcrosses of noninbred boars on fourth-generation inbred sows, 9.5 in crosses between strains, and 7.9 in all the crosses made among the various generations of the most advanced inbred strain.

Fed under record-of-performance conditions from 72 days of age to the time that individual weights of approximately 225 pounds were reached, inbred litters at Beltsville showed noteworthy variations in average daily gains and feed consumption. Average daily gains ranged from 1.05 to 1.50 pounds and feed consumption per 100 pounds of gain, from 348.6 to 409.8 pounds.

The pigs of both the sixth and seventh generations had less vigor than those of the fifth generation, as indicated by smaller size of litter and smaller birth and weaning weights. There was a higher mortality between birth and weaning for all inbred pigs than for the outcrosses, the crosses between lines, or the crosses among the various generations within the strain. The time required for the pigs of the sixth generation to reach the final weight of approximately 225 pounds was 10 percent longer than for those of the fifth generation. Final feed-lot data have not yet been obtained for the seventh-generation pigs.

Nutrition

Hogs were fed at three levels of protein intake with the total daily ration restricted to 3 percent of body weight. During the growth period from approximately 65 to 200 pounds, the rate of gain and the efficiency of feed utilization increased with increasing protein content of the diet up to the maximum fed, approximately 19 percent. On the highest protein level, gains were greater during the first half of the growth period. No differences were noted in firmness

of carcass, in market grade, nor in fatness as judged by the percentage of fat cuts or thickness of back fat.

Meat

Carcass studies of 155 hogs showed length of carcass, from first rib to aitch bone, to be a good index of dressing percentage and cutting yields. The hogs were divided into three groups--short, intermediate, and long--on the basis of carcass length. In these groups, the average lengths were 30.1, 31.4, and 32.7 inches, and average final feed-lot weights were 222, 222, and 224 pounds, ranging from 215 to 234 pounds. The average dressing percentages for the three groups were 74.9, 75.6, and 75.8. The hogs of the long-bodied group yielded the highest percentages of the leaner cuts, including ham, loin, picnic shoulder, and shoulder butt, and of sausage, and also of the cuts containing the higher proportion of bone, including spareribs, shoulder ribs, and feet. The short-bodied hogs were fatter than the longer hogs and yielded the highest percentages of the fatter cuts, including bacon, leaf fat, and cutting fat.

Studies were inaugurated during the year on the carcasses and meat from hogs of Danish Landrace and Danish Yorkshire breeding. The limited data showed the Landrace and Yorkshire hogs, among other differences, to be longer in body and better developed in ham than the average of 510 well-bred hogs of breeds commonly raised in the United States and slaughtered at a similar weight at Beltsville, Md., in recent years. For example, 4 hogs slaughtered from one Landrace litter averaged 1.2 inches longer in body from first rib to aitch bone and had about 25 percent greater plumpness of ham, in contrast to the previous observation that, for breeds in general, small-type hogs have the plumper hams.

In beef studies, the percentage of bone in the ninth, tenth, and eleventh rib cut, which is used as a standard carcass sample, was found to be closely related to the percentage of bone in the entire beef carcass. An equation by which the percentage of bone in the carcass can be estimated in a given case was developed as follows: Percentage of bone in carcass = $4.296 + 0.612 \times$ percentage of bone in ninth, tenth, and eleventh rib cut. It is expected that this method will prove useful to research workers and others who have need to estimate the bone content of beef carcasses rapidly and with little expense. Data from 84 steers and 36 heifers, varying from about 10 to 20 months of age at time of slaughter and in breeding, feeding, weight, degree of finish, and other characteristics, were used in these studies.

Beef and Dual-Purpose Cattle

Breeding

In record-of-performance studies with beef and dual-purpose cattle at the Beltsville Research Center, 12 beef calves (10 steers and 2 heifers) were weaned at 252 days of age, fattened on corn and alfalfa hay, and slaughtered when they had attained 900 pounds live weight. As in previous years, the results showed wide variations among individual animals. The average time required from birth to attain 900 pounds weight was 468 days. The daily gain per head from weaning to slaughter averaged 1.41 pounds. The digestible nutrients required for each 100 pounds of gain from weaning to slaughter average 668 pounds. The average fattening period was 216 days.

Record of the performance of 35 beef calves (13 steers, 16 heifers, and 6 bulls) from birth to weaning at 252 days showed that the heaviest calves at birth required the least feed per 100 pounds of gain up to weaning time. The feed requirements per 100 pounds of gain from weaning to slaughter weight were greatest with the calves that were heaviest at birth and at weaning time.

Twenty-seven head of Milking Shorthorn steers receiving whole milk, hand-fed or nursed, with grain and alfalfa, were weaned at 252 days of age and then fattened and slaughtered at 900 pounds. The average time required for a steer to attain a weight of 900 pounds was 495 days. The daily gains for the 27 head from weaning to slaughter averaged 1.53 pounds. The average number of days required for the fattening was 243.

Feeding

At the United States Range Livestock Experiment Station, Miles City, Mont., a plane-of-nutrition experiment was terminated August 7, 1934, covering a period of 952 days. In this experiment steers born in 1931 were carried in three groups, through winter seasons, as calves, yearlings, and 2-year-olds on high, medium, and low planes of feeding. The results indicate greater economy of production when steers were carried on medium-to-low planes of feeding, in which a greater proportion of the total gain in weight of steers was made on native range. Steers on the low plane of feeding, with a feed and range cost of $1.13 per 100 pounds of gain, averaged only 39.3 pounds lighter in weight than the steers on the high plane of feeding, with a feed and range cost of $3.41 per 100 pounds of gain.

In steer-feeding experiments in cooperation with the Texas Agricultural Experiment Station at Spur, Texas, well-developed steer calves were wintered on threshed white kafir grain, cottonseed meal,

and cottonseed hulls for the purpose of determining whether this ration is deficient in either vitamin A or lime. Control groups were fed similar rations except that a portion of the concentrates and cottonseed hulls were replaced by leafy alfalfa hay. The first indication of a supposed vitamin A deficiency was observed after the calves had been on feed 116 days. Each of the 10 calves receiving kafir grain, cottonseed meal, and cottonseed hulls showed this deficiency within 177 days. Cod-liver oil in varying quantities is being supplied to several of the affected steers, and they have apparently overcome the deficiency. Cod-liver oil from which vitamin A was removed has been supplied to several steers without beneficial results. Alfalfa in varying quantities is being supplied to several steers to determine the amounts necessary to overcome this deficiency. Carotene is also being administered to several steers to determine whether this source of vitamin A can be effectively used for the same purpose. The group of steers receiving as little as 1 pound of alfalfa has not shown any indication of a deficiency of vitamin A. There has been no indication of beneficial results from the inclusion of 0.1 pound of pulverized oyster shell per head daily, as a source of lime, in a ration consisting of ground threshed white kafir, cottonseed meal, and cottonseed hulls.

Management

During 1933 and 1934, grazing studies with cows and calves were conducted in cooperation with the Forest Service to test three intensities of grazing at the United States Range Livestock Experiment Station, Miles City, Mont. On overgrazed range, stocked at the rate of 1 cow to 23.1 acres for a year, calves weighed 68 pounds at birth and 263 pounds at weaning time. On moderately grazed range, stocked at the rate of 1 cow to 30.5 acres, calves had a birth weight of 75 pounds and a weaning weight of 301 pounds. On lightly grazed range, stocked at the rate of 1 cow to 38.8 acres, calves averaged 71.5 pounds at birth and 309 pounds when weaned. The pounds of calf produced per cow were 198, 278, and 240, respectively, for the overgrazed, moderately grazed, and lightly grazed ranges. The respective costs, per pound, of producing calves under the three intensities of grazing were 3.84, 2.44, and 2.83 cents.

At the Ardmore Field Station, Ardmore, S. Dak., 2-year-old steers grazed continuously on native range stocked at the rate of one steer to 10 acres from May 15 to September 14 (122 days), gained 83 pounds per steer as compared with 157 pounds gained by similar steers on alternate grazing but at the same rate of stocking. Steers receiving a barley supplement of 9.57 pounds per head daily on similar range gained 297 pounds per head, and an additional group fed a

barley supplement of 9.8 pounds per head daily for the last 66 days on grass gained 227 pounds per head. It was estimated that from 10 to 15 percent more grass remained at the end of the experiment when the area was grazed alternately than when it was grazed continuously.

Sheep, Goat, and Animal-Fiber Investigations

Farm-Sheep

Data obtained at Beltsville on live weights of lambs of various breeds at the age of 140 days show that Hampshires produced an average of 81.1 pounds of lambs per ewe as compared with 66.0 pounds for Corriedales, 58.8 for Shropshires, and 59.0 for Southdowns. A comparison was made of the live-lamb weight of the leading family with the average of the entire flock for each of these breeds. Hampshire family no. 1 produced 7.3 pounds more lambs than the average for the entire flock. Corriedale family no. 1 produced 5.5 pounds more, Shropshire family no. 1 produced 10.4 pounds more, and Southdown family no. 1 produced 9.6 pounds more than the average for the flock. Similar advantages to these families were found when the market grades of the lambs were compared. These data emphasize the advantages in the productivity of certain families or strains of sheep over others that may be very similar in appearance.

Range-Sheep

At the United States Sheep Experiment Station, Dubois, Idaho, ram lambs sired by individual stud rams of the Rambouillet, Corriedale, and Columbia breeds have been fed to determine the relative rate and economy of gain. A standard ration of whole oats and alfalfa was fed for approximately 110 days. Feed costs were based on average prevailing prices in the locality. The Rambouillet lambs gained at the rate of 0.479 pound daily per head and at a cost of $7.74 per 100 pounds of gain, the Corriedales at the rate of 0.416 pound daily per head and at a cost of $8.35 per 100 pounds of gain, and the Columbias at the rate of 0.490 pound daily per head and at a cost of $7.77 per 100 pounds of gain. Further analysis of the data showed that there were relatively great differences in the rate and economy of gain of lambs of the same breed sired by different stud rams. The trials point to the possibility of establishing strains within a breed that possess the ability to make maximum gains with minimum feed consumption.

Hampshire and Suffolk rams were mated with Rambouillet and Corriedale ewes to test the relative suitability of the rams of these

two breeds as sires of market lambs. First-year results showed a slightly larger Hampshire-sired lamb crop, but the Suffolk-sired lambs made greater daily gains after birth and were more than 4 pounds per head heavier at weaning. Ewes bred to Hampshire rams weaned 54.7 pounds of lamb per ewe bred, whereas ewes bred to Suffolk rams weaned 57.6 pounds of lamb per ewe bred. The Hampshire-sired lot of lambs carried slightly more finish at the market, but the Suffolk-sired lambs brought slightly higher prices per hundredweight.

Swine

A progeny test was conducted with two Chester White boars of different blood lines, bred to sows which were litter mates, for both spring and fall farrow. The sows were unrelated to the boars. The sows bred to boar A for the spring farrow were mated with boar B for the fall farrow, and vice versa. In both average birth weight and weaning weight, the litters sired by the two boars were practically the same. When fed from 72 days of age to a final feed-lot weight of approximately 225 pounds, however, the pigs from boar B were distinctly superior in feed-lot efficiency. In addition, the pigs from boar B required 17 days' less time to reach market weight of 225 pounds. The carcasses showed no material differences.

Studies on the inherent capacity of strains of swine to utilize feed and produce meat were begun this year at Miles City. Two selected Duroc-Jersey boars, nos. 333 and 310, were mated to two groups of duroc-Jersey sows, selected especially for uniformity. The pigs sired by boar no. 333 averaged 3.5 pounds more in weight at weaning than those by boar no. 310. Eighty-four days after weaning the pigs from boar no. 333 were well finished and averaged 207 pounds, whereas those from boar no. 310 averaged 174 pounds and were underfinished, "leggy", poorly developed in ham, and not ready for market. With little difference in feed consumed per 100 pounds of gain, the pigs from boar no. 333 gained 0.3 pound more per day than the others. Also their carcasses graded distinctly higher.

Horses and Mules

A second year's comparison at Miles City, Mont., of whole oats and alfalfa hay with alfalfa hay alone for wintering weanling colts showed results agreeing with the first year's work. Light-type weanlings made average daily gains of 1.27 pounds on the former ration compared with 0.83 pound on the latter. Feed consumed per 100 pounds of gain was 386 pounds of oats and 580 pounds of alfalfa hay by the former group, and 1,674 pounds of alfalfa hay by the latter group. Draft-type weanlings wintered on oats and alfalfa hay made average daily gains of 1.98 pounds and consumed 349 pounds of oats and 731 pounds of alfalfa hay per 100 pounds of gain.

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MARKET LAMB SHOWS AS AN EXTENSION PROJECT

By H. A. Lindgren, Extension Animal Husbandman,
Oregon Agricultural College

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Several years ago the extension specialists and R. L. Clark, secretary of the Portland Livestock Exchange, staged lamb-grading demonstrations in a number of the counties in western Oregon. These demonstrations were for the purpose of teaching farmers the points to consider in deciding when the lambs are ready to go to market. These events created a great deal of interest on the part of the farmers, and were considered well worth while activities.

Following this, the idea developed that these grazing demonstrations could be conducted more effectively in the form of lamb shows. The first lamb show in the State was held at Roseburg in 1931. A fund of $150 was raised to pay premiums and defray the cost of putting on the show. The officials of the city of Roseburg set aside one street in the center of town for the purpose of staging the event. Panels were constructed and wired together at the corners, in making the necessary pens for the lambs.

The first year, premiums were offered on classes of single fat lambs, and pens of five. A total of about 125 lambs were brought in by the farmers for this event. They were instructed to select and show their best market lambs, those that were ready to go to market, and having desirable weight and finish.

The lambs were judged on points that indicated market desirability. After the pens and singles had been placed, the farmers were given an opportunity to examine the various placings and to note the difference in condition and market desirability. Since this first event, four shows have been held on succeeding years in the same county. Several other counties also have joined in the undertaking, and it is our plan to extend this project to all counties where conditions are favorable.

The lamb show was considered not complete with only live lambs on exhibition hence it was decided to have a carcass show in addition. The butchers and meat dealers were interested in this move and eager to display one or two desirable lamb carcasses to be judged for premiums. The carcass show made it possible for the judges to compare a desirable carcass with the live lamb, pointing out the reason why it was so important to select lambs of the proper finish and weight. The order of events for a day of this kind is about as follows:

It is required that the lambs be in place about 10 o'clock in the morning. Then the judging takes place, first, of the live lambs, then of the carcasses. Sometimes a wool show is staged in connection with the other two events. Judges are then called on to discuss their placings and explain the points they considered in making the placings. The growers are then given the opportunity of handling the various pens in order to determine for themselves the differences in condition.

This is oftentimes followed by a sale of the lambs. If there is a carload on display, and usually there is, a buyer is contacted and the lambs are sold. As a rule, a premium is paid for the lambs. This stimulates a great deal of interest on the part of the lamb raisers in the county.

At some of our lamb shows, we have had as high as 500 people present and they usually stay throughout the day.

Very little equipment is required. The pens are made of 1 by 4 inch material in panels 6 ft. and 12 ft. in length. Enclosures are made 4 ft. by 6 ft. in size for the pens of 5 and 6 ft. by 6 ft. for the pens of 10. For the singles, smaller pens are used.

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YOU HAVE TO LIKE YOUR JOB

If you don't like your work, your income will be less than that of those who do, other factors being equal. The truth of this statement as applied to farming is shown by the following -

A number of Minnesota farmers were asked how they had happened to become farmers. Average earnings of the forty-three who took up farming from personal preference were $1,332, whereas the average earnings of sixty-two who engaged in farming because it was the only work they knew were but $1,074. Twenty-eight who became farmers because they inherited property earned only $795 on the average.

The value of liking farm work was proved in still another way. These men were asked if there were any particular enterprises they disliked but maintained because they thought them necessary to well-balanced farming. Forty-eight said they disliked poultry, and these obtained only $1.21 over feed costs per hen as compared with $1.94 for the rest of the group. Fourteen who disliked hogs made a return of 68 cents over feed cost per hundred pounds of pork produced, in comparison with $1.89 for all others. Twelve farmers who did not like dairy cows made $48 over feed cost per cow, while the majority averaged $64.

From Minn. Exp. Sta. Bu. 288, 1932.

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1935 STATE REPORT BRIEFS

Arkansas -

Six hundred and fifty-eight calves, 491 lambs, 4,007 pigs and 50 colts were involved in 4-H club work during the year. Three hundred and sixty purebred bulls, 199 purebred boars and 116 purebred rams were placed. Twenty-two hundred and eighty-nine families were aided in preparing and preserving home pork supplies, 680 families with home beef work and 3 with lamb and mutton.

Florida -

Three hundred and five purebred beef bulls were placed. Twenty-four hundred and fifty-two beef cattle were fed in feed lots and 4,778 in velvet bean fields. Approximately 100 carloads of heavy veal calves were shipped from the Kissimmee area direct to eastern slaughter markets, the first movement of the kind in history. Twenty trench silos were constructed, more than 500 bulls were "conditioned" prior to the breeding season, and 3 1/2 million pounds of meat were cured in cold storage.

Indiana -

Animal husbandry specialists held 351 meetings and demonstrations and contacted 38,430 livestock producers during the year. Twenty-five schools for horsemen, hogmen and sheepmen with a total attendance of 7,642 persons were held in 25 counties. Fourteen hundred and eighty-seven colts have been nominated for the 1936 Hoosier Gold Medal Colt Club. Twenty counties have conducted intensive thrifty pig project work.

Louisiana -

The beef-cattle specialist has devoted at least half of his time to meats work, including both beef and pork. Seventeen demonstration meetings were held with an attendance of 495. Two new plants are now curing meats for farmers with excellent results. Visits to all of the 38 curing plants operating in the State were made during the year. Due to the heavy emergency load on county agents, some losses of meats took place. Not more than 2,800,000 pounds of meat were cured in these plants in 1935. However, the interest is still keen and more work, especially in the southern

part of the State, is contemplated the coming season. County agents report 828 cases in which assistance was given on farm butchering.

Mississippi -

County agents report the purchase of 231 beef bulls, 225 boars, 24 rams, all purebreds, and 34 jacks. Higher prices for low grades of cattle have made profitable rather drastic culling of producing herds. Many of the culled females have been replaced by high grades or purebreds, county agents reporting the purchase of 124 purebred and high-grade beef cows and heifers, 316 sows and gilts, and 341 brood mares.

Pennsylvania -

Seven hundred sixty thousand pounds of wool was marketed by 31 different cooperative associations serving 4,585 producers in 40 counties. These associations started in 1919 when nearly 14 percent of the wool produced was unmerchantable. Now less than 5 percent is so. The grading table has been responsible for the improvement. One hundred forty-nine purebred rams were sold in 5 public sales. Three hundred colts were enrolled in colt club work and 280 baby beeves were fed by 4-H club members.

West Virginia -

Seventy-five purebred bulls and 238 purebred rams were placed. Four hundred thousand pounds of wool was graded and sold cooperatively, also 40,000 lambs and 1,000 beef calves.

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SOUTHERN ANIMAL HUSBANDRY CONFERENCES

At Jackson, Miss., on February 3-4, just preceding the 1936 meeting of the Southern Agricultural Workers' Association, a conference of extension animal husbandmen was held. Program planning in the light of new conditions, organization, methods, reports, cooperation with other agencies and the setting of goals for 1936 and the ensuing 5-year period were the major considerations.

The animal husbandry section of the Southern Agricultural Workers' meeting was attended by more than 60 persons. The program was excellent and the discussions constructive. Officers elected for next year were M. P. Jarnagin of Georgia, chairman, and L. I. Case of North Carolina, secretary.

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NONRAIL RECEIPTS OF LIVESTOCK, 1935

The following table shows the "drive-in" (nonrail) receipts of livestock in 1935 at 17 principal markets, also the percentage such receipts were of the total receipts. Total nonrail receipts at the listed markets made up 51.11 percent of the total receipts, the highest on record.

Market	No. head "drive-ins"	Percentage of total receipts
East St. Louis	2,663,798	60.11
Chicago	2,602,791	29.02
Omaha	2,143,128	51.08
Indianapolis	2,132,024	94.61
Sioux City	2,096,071	80.03
St. Paul	2,030,749	55.16
Kansas City	1,474,635	37.48
Fort Worth	1,322,152	64.34
St. Joseph	1,258,679	57.07
Cincinnati	1,036,970	70.25
Oklahoma City	997,317	91.60
Milwaukee	704,459	62.93
Wichita	589,108	78.67
Louisville	586,629	75.74
Sioux Falls	431,533	94.17
Denver	406,166	10.61
Portland	205,167	38.10
Total	22,681,376	51.11

Based on total reported receipts at the above markets the percentage of each class of livestock listed as "drive-ins" was as follows - Hogs, 69.34 percent; calves, 64.51 percent; cattle, 51.44 percent; and sheep and lambs, 31.50 percent.

For additional information on this subject see "Driven-In Receipts of Livestock, 1935" a mimeograph issued by the Bureau of Agricultural Economics, U. S. Department of Agriculture, Washington, D.C.

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SPECIAL NOTICE

It will be appreciated if the State specialists will arrange for copies of new material used in their projects, whether printed or mimeographed, to be sent to me promptly. Thanks. --C. D. Lowe

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The 1935 program of work was divided into two main parts, the regular livestock extension work and the supervisory work which was necessary in nine western Illinois counties to which the livestock extension specialist was assigned in connection with the AAA projects. The regular extension work was grouped, so far as possible, under one project to include beef cattle, sheep, hogs, and horses. This project is now entitled Livestock Management. The work is designed to show the principal things which successful farmers do which contribute to larger incomes. The problem relates to fitting livestock in general into the farm plan. Farm accounts show that the most successful stockmen make about $1,000 a year more than the poorest stockmen. Management is the principal responsible factor.

The new programs in crop adjustment have a tendency to increase the amount of pasture and legume crops. Even before these programs were started the livestock extension work has emphasized for four or five years the fundamental importance of increasing the acreage of pasture and of making better use of it during years of low grain prices. Farmers have been encouraged to seed more land to grass and other soil-building crops which may be suitable for pasture and hay. They have been assured that their net incomes may be just as great after this shift has been made.

In this State legumes for pasture and hay might well occupy 1 acre out of every 4 of Illinois farm land. This has long been recommended by the extension service of the University of Illinois. A study of farm records indicates that more net income is made upon farms with a larger percentage of the land in legumes.

Pasture fits the needs of cattle so well that rolling land is most often used for cattle pasture. During the last few years the extension specialist has encouraged farmers to feed cattle in the summer on pastures rather than in dry lot. This helps to utilize more land in grass and results have been good.

Legumes crops may well be included in the rations for all farm animals thus helping to make the farm self-supporting and reducing the amount of protein feeds which must be purchased in order to make satisfactory rations.

Goals for the Year and Ultimate Goals

	1935 Goal	1935 Record	1936 Goal	Ultimate Goal
Pulling contests.....	10	23	15	--
Big-team-hitch counties.....	88	88	90	90

Goals for the Year and Ultimate Goals (Cont'd.)

	1935 Goal	1935 Record	1936 Goal	Ultimate Goal
Big-team-hitch demonstrations	4	1	4	--
Livestock-project counties...	85	85	85	85
Livestock-project leaders....	2,300	2,402	2,600	3,500
Beef-cattle leaders.....	2,000	1,750	1,850	2,000
Hog leaders.....	3,500	3,500	3,500	3,500
Sheep leaders.....	700	640	700	800
Big-team leaders.....	800	720	800	1,000
Purebred-sire leaders.....	200	135	200	1,000

County schools have been the basis for instructing farmers in the livestock-management project. A mimeographed outline of the instruction has been furnished to each one who enrolled to follow the principles explained at the schools.

The men who have enrolled have been used as leaders in their communities. Their neighbors have been referred to them for elementary information regarding methods to use. Their farms have been chosen as demonstration farms whenever they had suitable material to illustrate the results of improved livestock management. All farmers have been invited to the demonstration meetings.

The most difficult problem has been one of extending this information to all farmers in the county and in getting farmers to utilize fully the information which they have been given. This winter discussion leaders have been selected who have agreed to lead the discussion at local meetings. These men have come to a county school of instruction regarding the procedure to use in leading a local discussion. The basis for the discussion in each case has been the mimeographed outline so that each man can stick fairly safely to the fundamental facts of importance. A total of 58 counties include an enrollment of 2,402 men who have declared their intention to handle their stock as the university has suggested. The instruction in local meetings will be conducted in these counties. We hope to enlist many more men in the project this winter by this means.

Demonstration meetings and livestock tours were held during the year to enable farmers to see for themselves successful stock feeding with inexpensive equipment, economical methods, and good but cheap rations. The county agent and the extension specialist attended these events and gave some definite instruction on each occasion.

Each month a one-page sheet entitled "Illinois Livestock Timely Topics," including two or three short stories prepared by the extension specialist, was sent to each county agent for use in the farm bureau paper or in the local newspaper. A number of other news stories were sent out during the year.

How the Work was Done

The extension specialist served principally to instruct the county agents and local leaders in subject matter and in methods of instruction. Experience has shown that the younger stockmen are more inclined to undertake this line of work than are the older men. All the local arrangements for meetings, demonstrations, and tours were entrusted to the county agents and the local leaders. In all cases their arrangements were satisfactory although sometimes it was possible improvements could have been made. It was found that local leaders took a great interest in their responsibility in selecting demonstration farms and in carrying out the details of tours to show results.

In connection with most of the county livestock tours explanations were given of market information as well as of production information. In many cases someone was present from one of the livestock markets and farmers took much interest in statements regarding market requirements, prices, and market trends. It was found that production and marketing information go well together with these groups of people.

The county agents promoted the boys' livestock club work, the county fairs, and the farmers' institutes. With the help of Smith-Hughes high-school agriculture teachers they cooperated with the Animal Husbandry Department of the University to compete in the annual State livestock judging contest. The extension specialist helped high schools, farmers' institutes, fairs, breed associations, cooperative marketing groups, and the Illinois Agricultural Association in promoting their livestock projects.

Livestock Management

The livestock management project is designed to emphasize the principal things which successful stockmen do that seem to contribute most to their extra income as compared with poorer stockmen. Basing the discussion upon farm records the program in each county has emphasized the fact that the better stockmen raise better animals than others do, keep them healthier, sell stock in better market condition, sell on higher markets, make better use of their horses, have more land in legume crops for pasture and hay, and use those legume crops to help balance their rations so that they buy less feed. To supplement the

instruction a mimeographed outline has been prepared which is given to each cooperator. It includes the principal items discussed concerning the project with concise and correct information. It is divided into seven divisions including general principles, pastures, beef cattle, sheep, hogs, horses, and a conclusion. Altogether there are 82 separate sections or paragraphs included in the seven divisions. This outline has proved to be very useful. Many of the high-school-agriculture teachers use it in their classes.

This year a special effort has been made to enlarge the activities in this project by means of local discussion leaders. The outlines are designed to help these leaders in conducting a discussion of any length from a 30-minute talk upon the whole livestock management subject to several talks upon separate divisions of it. During November and December, 54 county schools of instruction were held for these discussion leaders. The schools were held early in the winter so that there would be plenty of time at winter meetings for the local work to be extended.

The first county to make organized progress in this phase of the project was Whiteside County. Thirteen meetings in that county were scheduled to be held in different localities on Friday afternoon, December 13, which was designated as "Livestock Management Day." In their discussions there the local leaders gave special emphasis to sanitation, the value of proteins for rations, and the mineral requirements of livestock. Smith-Hughes agriculture teachers and farmers served as discussion leaders.

In this livestock-management project a record is kept in each county of the men who signify their intention to manage their livestock as suggested by the University of Illinois. These men receive such special attention as can be given to their problems by the extension specialist and the county agent. Beginning this year they receive once each 3-month season a mimeographed sheet entitled "Livestock Management." This is prepared by the extension specialist and sent in numbers to each county agent so that he can pass these on with any comments which he has to each cooperator. The sheet is printed on both sides and gives pertinent suggestions regarding management of livestock at the particular season of the year. It has proved to be popular and it is widely quoted.

The enrollment card which the men check and sign has been revised to make it more readily understood and more quickly filled out at local meetings. The revised card is as follows:

_____Township _____County Date_____

The undersigned desires to enroll, as checked, in Livestock Management, Extension Service in Agriculture and Home Economics, University of Illinois. He will endeavor to: 1. Raise better animals, 2. Keep stock healthier, 3. Sell stock in better market condition, 4. Sell on higher markets, 5. Make more efficient use of the horses, 6. Make more use of legumes for pasture and hay, and 7. Combine home-grown feeds into better rations. The Livestock Management Outline on Handling Livestock to Increase Market Prices and Farm Incomes will be used as a guide.

1. Beef Cattle, including breeding or fattening cattle. Check_____
2. Sheep, including ewes and lambs raised or fattened. Check_____
3. Hogs, emphasizing both health and economical feeding. Check_____
4. Horses, even if a tractor is used, too, upon the farm. Check_____
   How many horses will be the most you work in one team?_____
5. Purebred Sires. Only good purebred sires to be used. Check_____

Name_____ Address_____

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SOUTH DAKOTA 4-H LAMB CLUBS

For some years a fat-lamb project for interested 4-H club members has been conducted. Under this plan a club member could take one or more lambs, fatten them, exhibit them at the State fair and dispose of them in the annual sale at the fair. Such a practice in fattening lambs is not necessarily an economical one and it has been our belief that the fattening of lambs by 4-H club members might well be conducted along good farm-management practices, such as followed by our most successful lamb feeders. This would call for feeder lambs being put on feed in the fall and finished for the winter market. In 1934, Butte and Lawrence counties started such a project primarily at the instigation of Boyer Aune, superintendent of the experimental work on the Belle Fourche Irrigation Project.

This effort was a success and the members participating and their parents were quite enthusiastic over its results. Consequently, in 1935 this type of club was set up as a State project and qualified boys in the Belle Fourche area and in the eastern and southeastern parts of the State were encouraged to enroll. Arrangements were made with local banks for credit, where needed, and the Sioux Falls Stock Yards Company and the livestock exchange at that market are sponsoring

and financing a 4-H fat lamb show and sale, under the name of The Sioux Falls Tri-State Fat Lamb Show and Sale. It is required that each member feed out 15 head of lambs. Suitable cash prizes are offered in the first show and sale event which is scheduled for January 14-16, 1936. Awards are to be made on the basis of total gains, economy of gains, placing by the judge, completeness, accuracy and neatness of records and the part taken by the members in meetings of his club.

One hundred members are enrolled at present and it is anticipated that the final activity of the project at Sioux Falls will meet with success.

--From South Dakota Annual Report, 1935

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RECENT PUBLICATIONS

(Only Federal publications are available from Washington. Others listed may be obtained in most instances from the institution or agency issuing them).

Federal

"Beef Cattle Especially Adapted to Gulf Coast Area Being Developed" - U.S.D.A. Yearbook Separate No. 1522. 4 pages. 1935.

"Hams Stored in Tight Cloth Bags Keep Well for Use in Farm Home" - U.S.D.A. Yearbook Separate No. 1525. 3 pages. 1935.

"Hogs of Danish Origin Imported for Breeding Studies in This Country" - U.S.D.A. Yearbook Separate No. 1526. 3 pages. 1935.

"Pastures That Are Well Managed Serve as Means of Drought Insurance" - U.S.D.A. Yearbook Separate No. 1530. 4 pages. 1935.

"Sheep Improvement in U. S. Should Result from Recent Importations" - U.S.D.A. Yearbook Separate No. 1531. 4 pages. 1935.

"Beef Cattle, Hog and Sheep, Lamb and Wool Outlook Charts for 1936" - Bureau of Agricultural Economics, U.S.D.A.

"Boys' and Girls' 4-H Club Work" by C. B. Smith - U.S.D.A. Extension Service Miscellaneous Circular No. 77. 14 pages, 13 illus. Nov. 1935.

"Cattle on Farms and Ranches, Swine on Farms and Ranches, Sheep on Farms and Ranches, and Horses and Mules on Farms and Ranches" -

Statistical summaries from the U. S. Census of agriculture, 1935. Bureau of the Census, U. S. Department of Commerce.

"Driven-In Receipts of Livestock, 1935" - Livestock, Meats and Wool Division, Bureau of Agricultural Economics, U.S.D.A. Feb. 1936. 28 pages, mimeographed.

"Effect of Manufacture on the Quality of Nonoily Fish Meals," by Roger W. Harrison, et al - Investigational Report No. 30, Bureau of Fisheries, U.S. Department of Commerce. 30 pages. 1935.

"Effect of Method of Manufacture on the Composition of Haddock Fish-Meal Proteins" by S. R. Pottinger, et al - Investigational Report No. 31, Bureau of Fisheries, U. S. Department of Commerce. 14 pages. 1935.

"Estimated Production and Consumption of Federally Inspected Meats, 1935" - Livestock, Meats and Wool Division, Bureau of Agricultural Economics, U.S.D.A. - Mimeographed tables.

"United States Livestock Report: January 1, 1936" - U.S.D.A. Bureau of Agricultural Economics. Feb. 1936. 19 pages. Mimeographed tables.

"National 4-H Club Report, 1934" by R. A. Turner - U.S. D. A. Extension Service Circular 232. Feb. 1936. 15 pages. Mimeographed.

"The Relationship of Age and Other Factors to Enrollment and Continuation in 4-H Club Work" by Lucinda Crile - U.S.D.A. Extension Service Circular 231. Dec. 1935. 29 pages. Mimeographed.

"A Study of Ranch Organization and Operation in North-Central Texas" - U.S.D.A. Bureau of Agricultural Economics and Bureau of Animal Industry. Jan. 1936. 73 pages. Mimeographed.

"Studies on Drying Cod and Haddock Waste" by Andrew W. Anderson, et al - Investigational Report No. 32, Bureau of Fisheries, U. S. Department of Commerce. 1935. 41 pages.

"Utilization and Cost of Power on Mississippi and Arkansas Delta Plantations" by L. A. Reynoldson, et al - U.S.D.A. Technical Bulletin No. 497. Dec. 1935. 47 pages. 10 illus.

State

"The Raising of Hogs" by Geo. W. Carver - Tuskegee Normal and Industrial Institute, Alabama. 7 pages. Oct. 1935.

"A Cheap Repellent for Buffalo Gnats" by H. H. Schwardt - Arkansas Extension Service Circular No. 341. May 1935. 3 pages.

"Crossbreeding Investigation in the Production of California Spring Lambs" by Robert F. Miller - California Experiment Station Bulletin No. 598. Dec. 1935. 32 pages. 7 illus.

"Cattle Feeding - Winter Steer Feeding, 1931-1932" by J. H. Skinner and F. G. King - Indiana Experiment Station Bulletin No. 396. Mar. 1935. 11 pages.

"The Effect of Soybeans, Soybean Oil Meal, and Tankage on the Quality of Pork" by Vestal and Shrewsbury - Indiana (Purdue) Experiment Station Bulletin 400. 1935. 47 pages.

"Manure Increases Farm Income" by A. T. Wianckó, et al - Indiana Experiment Station Bulletin No. 398. Mar. 1935. 20 pages. 5 illus.

"Home Butchering in Iowa" Vol. 4, Jan. 1936 - Agricultural Extension Service, Iowa State College. 8 pages. illus.

"A Survey of The Sheep Industry of Maryland" by Wells E. Hunt - Maryland Experiment Station Bulletin No. 378. 43 pages. 3 illus. July 1935.

"Soybean Pasture for Fattening Hogs" by B. E. Carmichael - Maryland Experiment Station Bulletin No. 376. June 1935. 13 pages.

"A Study of the Consumption of Meats in Minneapolis, 1934" by Warren C. Waite and Rex W. Cox - Minnesota Experiment Station Bulletin 321. June 1935. 7 illus.

"Good Pastures Improve the Pig Crop" by A. G. Hogan and S. R. Johnson - Missouri Experiment Station Circular 187. June 1935. 4 pages. 2 illus.

"Alfalfa Meal vs. Long Alfalfa for Fattening Steers" by R. R. Thalman - Nebraska Experiment Station Circular 150. 1934. 3 pages.

"Grinding Shelled, Ear, and Snapped Corn for Yearling Steers" by Thalman and Cathcart - Nebraska Experiment Station Circular 143. 1934. 10 pages.

"Silage, Bone Meal, Tankage, Meat Scraps and Straw in Rations for Fattening Lambs" by M. A. Alexander - Nebraska Experiment Station Circular 328. 1935. 5 pages.

"Combinations of Corn and Soybeans for Silage" by R. G. Wiggans - New York Experiment Station Bulletin 634. June 1935. 34 pages. 6 illus.

"The Livestock Auction in Ohio" by Eckert and Henning - Ohio Experiment Station Bulletin 557. Oct. 1935. 27 pages.

"Some New Methods of Preserving Legume Forage" - Ohio Experiment Station Bimonthly Bulletin No. 177, Vol. XX. Nov.-Dec. 1935.

"The Establishment and Maintenance of Herds of Cattle Free from Bang's Disease" by Simms and Muth - Oregon Experiment Station Bulletin 332. June 1934. 11 pages.

"Winter-Finishing Two-Year-Old Grass Steers" by Jacob and Duncan - Tennessee Experiment Station Bulletin No. 156. Nov. 1935. 12 pages.

"Effect of Age, Sex, and Fertility of Angora Goats on the Quality and Quantity of Mohair" by J. M. Jones, et al - Texas Experiment Station Bulletin No. 516. Nov. 1935. 34 pages. 11 illus.

"Phosphorus Supplements Improve Sugar-Beet By-Product Rations for Cattle" by E. J. Maynard, et al - Utah Experiment Station Bulletin No. 265. Jan. 1936. 29 pages. 8 illus.

"The Digestibility of Artificially Dried Roughages" by J. A. Newlander - Vermont Experiment Station Bulletin 400. Nov. 1935. 12 pages.

"Power on West Virginia Farms" by F. D. Cornell, Jr. - West Virginia Experiment Station Bulletin 267. June 1935. 44 pages. illus.

"How to Conduct Group Discussion" by Wileden and Ewbank - Wisconsin Extension Service Circular 276. Aug. 1935. 64 pages.

"Crossbreeding with Western Ewes" by Frederic S. Hultz, et al. - Wyoming Experiment Station Bulletin No. 210. Nov. 1935. 20 pages. illus.

"A Five-Year Study of Hampshire Show Sheep" by Frederic S. Hultz - Wyoming Experiment Station Bulletin No. 207. Sept. 1935. 60 pages. illus.

Other

"1936 Feeding Practices" by A. L. Ward - Bulletin No. 10 of the National Cottonseed Products Association, 1411 Santa Fe Bldg., Dallas, Texas.

"Cattle Handbook for the Grower and Feeder" by H. M. Conway - National Live Stock Marketing Association, 160 No. LaSalle St., Chicago, Ill. (50¢ postpaid).

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